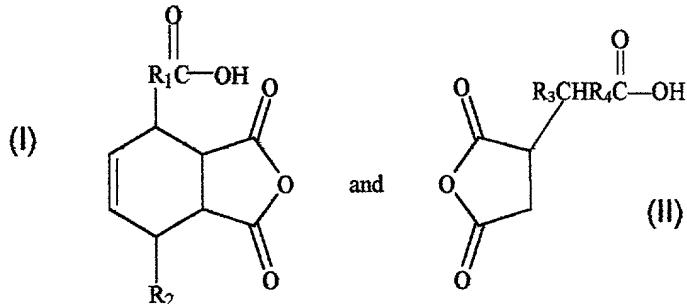


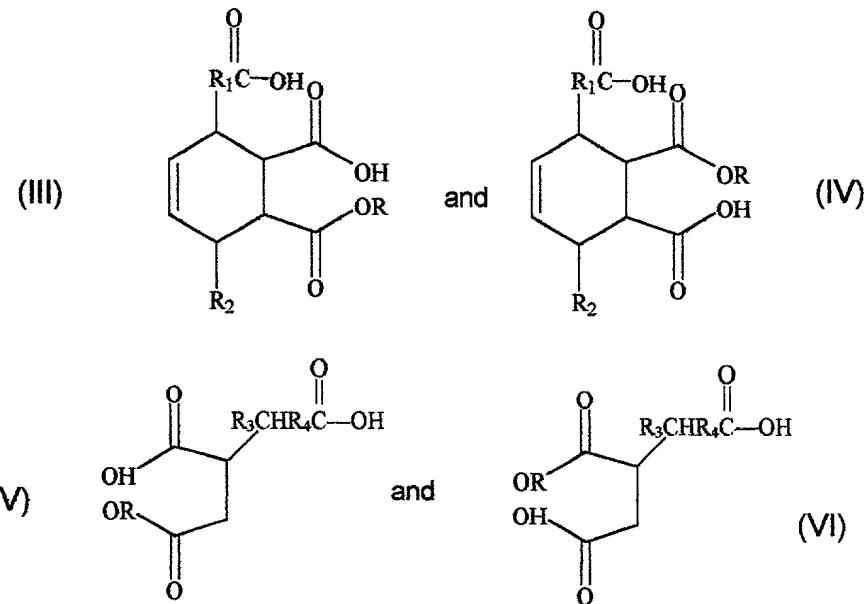
Claims

We Claim:

- 1 1. A method of reducing drag of a fluid, comprising:
 - 2 providing a fluid; and
 - 3 adding to the fluid an amount of an additive effective to reduce the drag of
 - 4 the fluid, the additive being selected from the group consisting of
 - 5 maleated fatty acids, esters and salts thereof.
2. The method of claim 1 where the fluid is selected from the group consisting of hydrocarbons, mixtures of hydrocarbons and water, and mixtures of hydrocarbons, water and gas.
3. The method of claim 1 where the additive is selected from the group consisting of:



and



where R is an organic moiety including alkyl, aryl, aralkyl, alkaryl or amine groups;

R₁ is a generally linear organic moiety of from about 2 to about 20 carbon atoms;

R₂ is hydrogen or a generally linear organic moiety of up to about 20 carbon atoms, where the total number of carbon atoms in R₁ and R₂ are from about 2 to about 20 carbon atoms;

R₃ is an alkylene or alkenylene group of from about 2 to about 15 carbons;

and

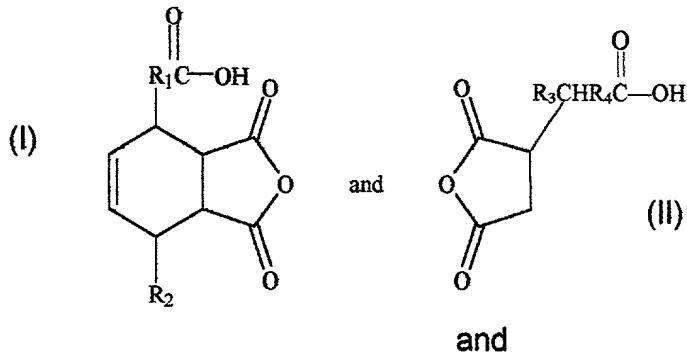
R₄ is an alkylene or alkenylene group of from about 2 to about 15 carbons; and inorganic, organic, and amine salts thereof.

4. The method of claim 1 where the additive is selected from the group consisting of imidazoline salts of; primary, secondary, and tertiary amine salts of; alkoxylated amine salts of; heterocyclic amine salt forms of the maleated fatty acids and maleated fatty acid esters and mixtures thereof.

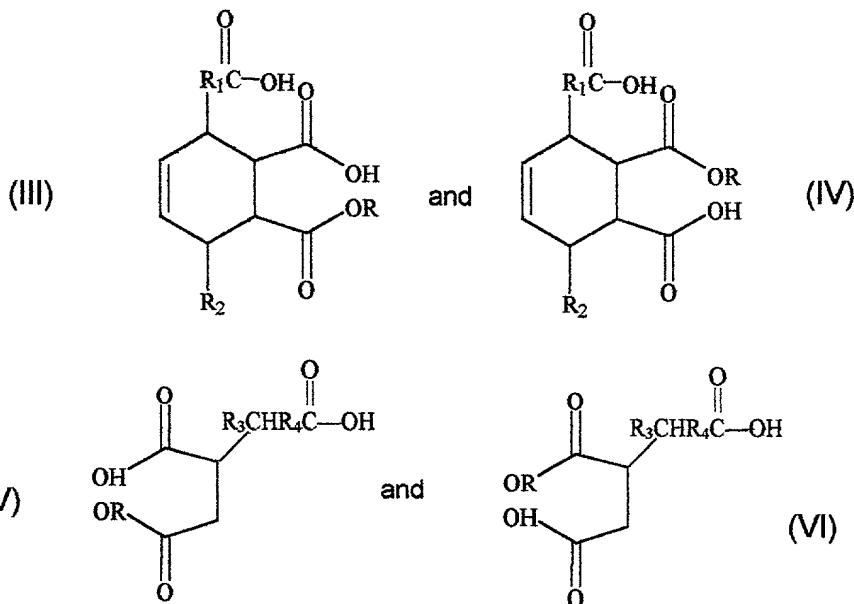
5. The method of claim 1 where the amount of additive based on the total amount of fluid ranges from about 100 to 1000 ppm.

6. The method of claim 1 where the additive contains more than one maleated fatty acid, ester and salt thereof.

1 7. A method of reducing drag of a fluid, comprising:
2 providing a fluid selected from the group consisting of hydrocarbons,
3 mixtures of hydrocarbons and water, and mixtures of hydrocarbons,
4 water and gas; and
5 adding to the fluid an amount of an additive effective to reduce the drag of
6 the fluid, where the additive is selected from the group consisting of:
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12 where R is an organic moiety including alkyl, aryl, aralkyl, alkaryl or amine groups;
 13 R₁ is a generally linear organic moiety of from about 2 to about 20 carbon
 14 atoms;
 15 R₂ is hydrogen or a generally linear organic moiety of up to about 20 carbon
 16 atoms, where the total number of carbon atoms in R₁ and R₂ are from
 17 about 2 to about 20 carbon atoms;
 18 R₃ is an alkylene or alkenylene group of from about 2 to about 15 carbons;
 19 and
 20 R₄ is an alkylene or alkenylene group of from about 2 to about 15 carbons;
 21 and inorganic, organic, and amine salts thereof.

8. The method of claim 7 where the additive is selected from the group consisting of imidazoline salts of; primary, secondary, and tertiary amine salts of; alkoxylated amine salts of; heterocyclic amine salt forms of the maleated fatty acids and maleated fatty acid esters and mixtures thereof.

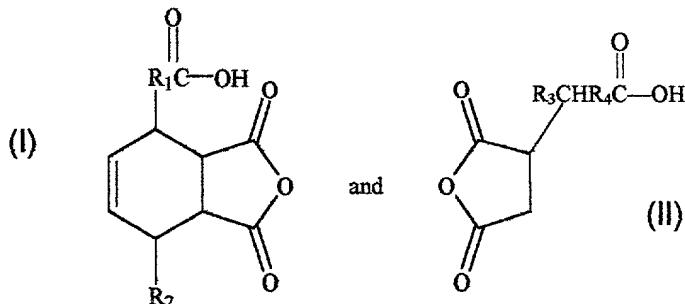
9. The method of claim 7 where the amount of additive based on the total amount of fluid ranges from about 100 to 1000 ppm.

10. The method of claim 7 where the additive contains more than one maleated fatty acid, ester and salt thereof.

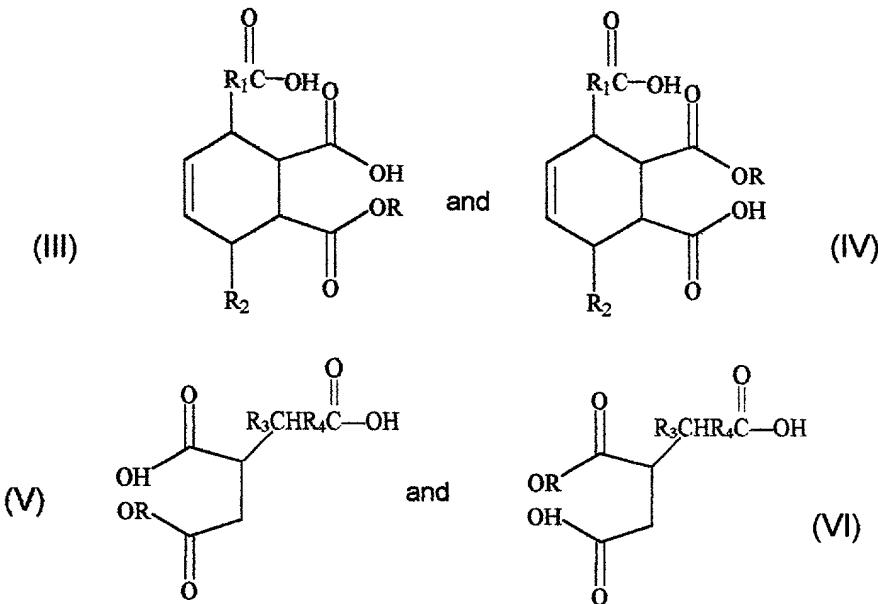
1 11. A reduced drag fluid, comprising:
2 a fluid; and
3 an amount of an additive effective to reduce the drag of the fluid, the additive
4 being selected from the group consisting of maleated fatty acids,
5 esters and salts thereof.

12. The reduced drag fluid of claim 11 where the fluid is selected from the group consisting of hydrocarbons, mixtures of hydrocarbons and water, and mixtures of hydrocarbons, water and gas.

13. The reduced drag fluid of claim 11 where the additive is selected from the group consisting of:



and



where R is an organic moiety including alkyl, aryl, aralkyl, alkaryl or amine groups;

R₁ is a generally linear organic moiety of from about 2 to about 20 carbon atoms;

R₂ is hydrogen or a generally linear organic moiety of up to about 20 carbon atoms, where the total number of carbon atoms in R₁ and R₂ are from about 2 to about 20 carbon atoms;

R₃ is an alkylene or alkenylene group of from about 2 to about 15 carbons; and

R₄ is an alkylene or alkenylene group of from about 2 to about 15 carbons; and inorganic, organic, and amine salts thereof.

14. The reduced drag fluid of claim 11 where the additive is selected from the group consisting of imidazoline salts of; primary, secondary, and tertiary amine salts of; alkoxylated amine salts of; heterocyclic amine salt forms of the maleated fatty acids and maleated fatty acid esters and mixtures thereof.

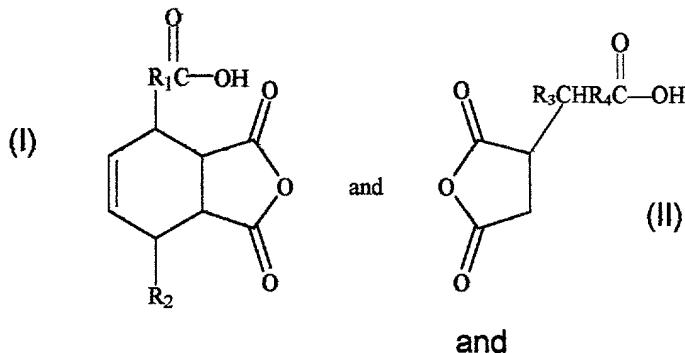
15. The reduced drag fluid of claim 11 where the amount of additive based on
the total amount of fluid ranges from about 100 to 1000 ppm.

16. The reduced drag fluid of claim 11 where the additive contains more than
one maleated fatty acid, ester and salt thereof.

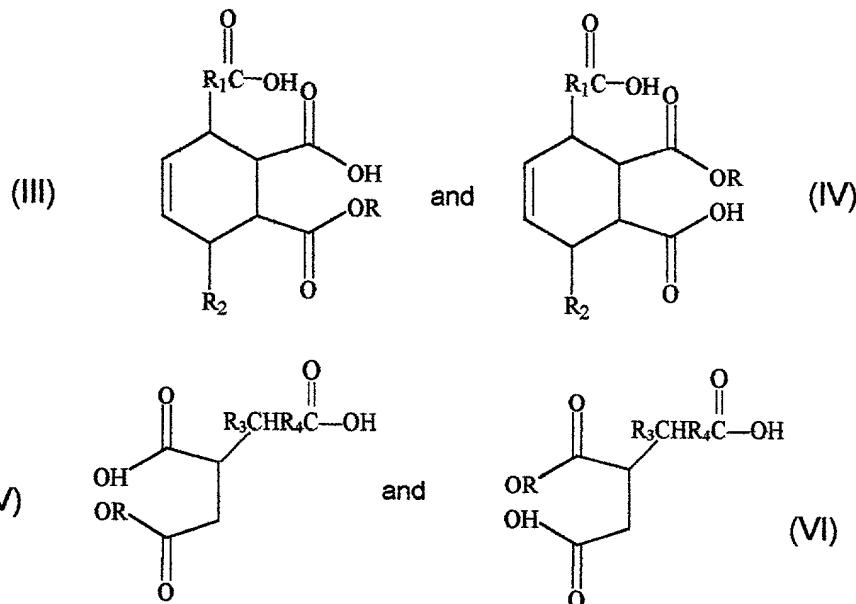
1 17. A reduced drag fluid, comprising:

2 a fluid selected from the group consisting of hydrocarbons, mixtures of
3 hydrocarbons and water, and mixtures of hydrocarbons, water and
4 gas; and

5 an amount of an additive effective to reduce the drag of the fluid, where the
6 additive is selected from the group consisting of:



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11

12 where R is an organic moiety including alkyl, aryl, aralkyl, alkaryl or amine groups;

13 R₁ is a generally linear organic moiety of from about 2 to about 20 carbon atoms;

14 R₂ is hydrogen or a generally linear organic moiety of up to about 20 carbon atoms, where the total number of carbon atoms in R₁ and R₂ are from about 2 to about 20 carbon atoms;

15 R₃ is an alkylene or alkenylene group of from about 2 to about 15 carbons;

16 and

17 R₄ is an alkylene or alkenylene group of from about 2 to about 15 carbons;

18 and inorganic, organic, and amine salts thereof.

18. The reduced drag fluid of claim 17 where the additive is selected from the group consisting of imidazoline salts of; primary, secondary, and tertiary amine salts of; alkoxylated amine salts of; heterocyclic amine salt forms of the maleated fatty acids and maleated fatty acid esters and mixtures thereof.

19. The method of claim 17 where the amount of additive based on the total amount of fluid ranges from about 100 to 1000 ppm.
20. The method of claim 17 where the additive contains more than one maleated fatty acid, ester and salt thereof.

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